

REMARKS

In connection with the Office Action dated May 12, 2005, the Examiner has:

- (1) rejected claims 1-3 under 35 U.S.C. § 103(a) as being unpatentable over Pollack (U.S. Patent No. 4,802,431);
- (2) rejected claims 1-3 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
- (3) objected to claims 4-18 under 37 CFR 1.75(c) as being in improper form since a multiple dependent claim may not depend upon another multiple dependent claim.

In the present response, claims 1, 3-4, 7, 9-10, and 12-17 have been amended. Upon entry of the amendment, claims 1-18 remain pending in the present application. Applicant requests reconsideration in view of the following remarks and foregoing amendments.

35 U.S.C. § 103

With respect to item (1), the Examiner has found claims 1-3 to be obvious over Pollack.

Independent claim 1 has been amendment to now recite a mooring buoy that includes, among other things, a substantially horizontally oriented transfer duct that *is a mid-depth transfer pipe*. Support for such an amendment can be found on page 5 (lines 1-2) of the present application.

In order to highlight certain aspects of the present invention, the following brief, non-limiting description is provided. The claimed invention, as set forth in the present application, relates to a slender mooring buoy (6) for use specifically in deep water. The long and slender buoy of the present invention may be anchored to the sea bed via taught anchor legs (27, 28) and may be connected near its bottom to a mid-depth transfer duct (15), extending in a substantially horizontal direction over a large distance from, for instance, a remote hydrocarbon storage or production facility to the buoy. A vessel may be anchored to the buoy via a mooring line and a mooring connector (9). In connection with the present invention, the forces of the buoy, partly caused by the moored vessel, are

not transferred to the horizontal transfer duct in a fatigue imparting manner. Nevertheless, sufficiently stable mooring of the vessel via the mooring line can be achieved since the buoy has a substantially large restoring moment upon sideways tilting due to its relatively long construction in combination with the taut anchor legs that are attached to the sea bed.

Pollack, on the other hand, discloses a transfer riser that enables simple determination of the vessel drift and which can be constructed at low costs (col. 1, lines 57-63). In particular, Pollack teaches a horizontal underwater pipe 12 lying near the sea floor (col. 2, lines 47-50) that is connected to vertical riser conduit 22 of a riser 24. The riser 24 is anchored to the sea bed via a chain table 36 and a group of catenary chain devices 40a, 40b. A position-restoring dead weight 44 is connected to the chain table to restore the table to a quiescent position in which riser 24 is vertically oriented. The top of riser 24 is connected to a dynamically positioned vessel 16 via a hose 26 and a universal joint 60.

Pollack, unlike the buoy of the present invention, chooses to support the horizontal pipeline on the sea bed, such that the exertion of forces on that pipeline due to heave or tilting movements of the vertical riser 24 will be limited, and will be accommodated by lower conduit 20.

In contrast, the horizontal duct of the present invention is not supported on the sea bed. Rather it is positioned in mid-water. To that end, the motion of the buoy can be fully transferred to the horizontal duct, and will be more critical in regard to fatigue weakening as opposed to the Pollack construction.

Furthermore, the Pollack chain table 36 is anchored to the sea bed via catenary chains, and allows a predetermined amount of drift of the vessel 16 during calm weather. Specifically, Pollack teaches that during stormy weather, the dynamic positioning system of the vessel 16 will limit the excursion (col. 1, line 60 to col. 2, line 3), and that the inclination of the riser 24 is measured by sensors to determined the vessel drift.

In contrast, the buoy of the present invention may be moored via *taut mooring legs*, and has a length between 20 m and 70 m. The mooring of the present invention in comparison to the riser in Pollack is, therefore, relatively short, i.e., it does not extend all

the way to the sea bed. Such a design, as a result, can cause the buoy of the present invention to exert a restoring moment on the vessel upon drift, and can return the vessel to an equilibrium position in which the buoy is vertically oriented, rather than being in static inclination, as is the case in Pollack.

Pollack also teaches that the vertical riser 24 connects the horizontal pipe 12 to the vessel 16. In contrast, the vertical duct 21 of the present invention is supported by the buoy, which is a separate construction carrying the duct.

In summary, Pollack fails to teach or disclose a substantially horizontal mid-depth transfer duct as set forth in amended claim 1. Such a transfer duct can be coupled to a vessel in a simple and effective manner while reducing fatigue problems associated with the transfer duct. In contrast, Pollack teaches a sea bed-supported pipeline, which does not have to address undesired dynamics, as is the case with the mid-depth transfer duct of the present invention. Moreover, connection of the vessel in Pollack takes place via a vertical riser, rather than via a buoy which acts to support a relatively short vertical duct.

35 U.S.C. § 112

With respect to item (2), the Examiner has rejected claims 1-3 as being indefinite under 35 U.S.C. § 112, second paragraph. Independent claim 1 has been amended, so as to clearly and distinctly claim the subject matter which the Applicants regard as the invention. Accordingly, Applicants submit that claims 1-3 are in condition for allowance.

Multiple Dependency

With respect to items (3), claims 4-18 have been rejected as being in improper multiple dependency format. Claims 4-18 have been amended to remove the multiple dependencies therefrom. Accordingly, claims 4-18 are now in compliance with 37 CFR 1.75 (c).

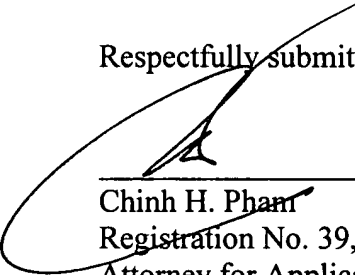
Conclusion

In view of the foregoing amendments and remarks, Applicants submit that the pending claims clearly and distinctly set forth the subject matter of the present invention, and are not rendered obvious by Pollack

Accordingly, Applicants submit that the claims are now in condition for allowance. Withdrawal of the pending rejections and objections, and early and favorable reconsideration are respectfully solicited. In the event that a telephone conversation would further prosecute and/or expedite allowance, the Examiner is invited to contact the undersigned at (617) 310-6000.

Applicants hereby request a two (2) month extension of time and authorize that the two month extension fee of \$225.00 be charged to Deposit Account No. 50-2678. Applicants do not believe that any other extension or additional fee is required in connection with this Response. However, should any extension or fee be required, Applicants hereby petition for same and requests that such and any other fee required for timely consideration of this application be charged to Deposit Account No. 50-2678.

Respectfully submitted,



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